

SECTION I.—AEROLOGY.

SOLAR AND SKY RADIATION MEASURED AT WASHINGTON, D. C., DURING DECEMBER, 1915.

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[Dated: Washington, D. C., Jan. 17, 1916.]

In Table 1 are summarized the measurements of the intensity of direct solar radiation made by the Weather Bureau at the American University,¹ Washington, D. C., during December, 1915. The means for the month are somewhat lower than the five-year means for December published in the Bulletin of the Mount Weather Observatory, 5:182, Table 3, and markedly lower than those for December, 1914, published in the REVIEW for December, 1914, 42:648.

Skylight polarization, measured at solar distance 90° and in his vertical, with the sun at zenith distance 60°, averaged 60 per cent, with a maximum of 66 per cent, which is 3 per cent higher than the average monthly maximum for December published in the Bulletin of the Mount Weather Observatory, 3:114, Table 16.

TABLE 1.—Solar radiation intensities at Washington, D. C., during December, 1915.

[Gram-calories per minute per square centimeter of normal surface.]

Date.	Sun's zenith distance.										
	0.0°	48.3°	60.0°	66.5°	70.7°	73.6°	75.7°	77.4°	78.7°	79.8°	80.7°
	Air mass.										
	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
1915.											
A. M.	Gr.-cal.	Gr.-cal.	Gr.-cal.	Gr.-cal.	Gr.-cal.	Gr.-cal.	Gr.-cal.	Gr.-cal.	Gr.-cal.	Gr.-cal.	Gr.-cal.
Dec. 1			1.14	1.17	1.11	1.05					
2											
3			0.89	0.77	0.67	0.60	0.52	0.76	0.68	0.60	0.53
4								0.44	0.38	0.35	0.30
5			1.31	1.25	1.09	1.03	0.96	0.90	0.83	0.77	0.72
6				1.16	1.16	1.08	0.99	0.93	0.88	0.83	0.78
7											
15			1.18								
16			1.12								
19			1.03	0.95	0.82	0.70	0.63	0.56	0.49	0.44	0.40
21							0.78	0.73	0.67	0.62	0.56
23			1.28				0.98	0.92			
24			1.31	1.24	1.17						
26			1.11	0.96	0.89						
30											
Means			1.15	1.07	0.99	0.89	0.81	0.75	0.66	0.60	0.55
P. M.											
Dec. 7				1.10	1.02	0.95	0.88	0.81	0.74	0.68	0.63
15				1.24	1.18	1.12	1.05	0.99	0.93		
21				1.04	1.01	0.86	0.77	0.72	0.67	0.62	0.57
22							0.89	0.81	0.74	0.68	
30				0.94	0.77	0.59					
Means				1.08	1.00	0.88	0.90	0.83	0.77	0.66	(0.60)

In Table 2, column 2 gives the daily totals of solar and sky radiation received on a horizontal surface at the American University during December, 1915. The measurements were made with a Calendar recording pyrliometer, as described in the REVIEW for March, 1915, 43:100. Table 2, column 3, gives the daily departures from the normals published in the same number of the REVIEW, page 111, Table 4. A deficiency of radiation is shown for every decade of the month.

¹ For a description of exposures of instruments and details of methods of observation, see this REVIEW, December, 1914, 42:648.

The "Percentage of possible sunshine" and the "Average cloudiness," given in columns 5 and 6 of Table 2, have been taken from the records of the observatory at the central office of the Weather Bureau. The monthly mean percentage of possible sunshine is 51, which is also the normal for Washington for December. The deficiency in the total radiation for the month is therefore to be attributed to low radiation intensities, as indicated by Table 1, rather than to excessive cloudiness.

TABLE 2.—Daily totals and departures of solar and sky radiation at Washington, D. C., during December, 1915.

[Gram-calories per square centimeter of horizontal surface.]

Date.	Daily totals.	Departure from normal.	Excess or deficiency since first of month.	Percentage of possible sunshine.	Average cloudiness.
	Gr.-cal.	Gr.-cal.	Gr.-cal.	Per cent.	0-10.
December 1	188	10	10	54	7
2	126	— 50	— 40	23	8
3	163	— 12	— 52	55	6
4	174	1	— 51	76	3
5	187	15	— 36	70	5
6	182	11	— 25	54	6
7	223	52	27	100	0
8	64	— 106	— 79	17	8
9	116	— 54	— 133	36	7
10	302	33	— 100	79	2
11	184	15	— 85	63	6
12	94	— 74	— 159	4	10
13	103	— 65	— 224	6	9
14	159	— 8	— 232	55	6
15	234	67	— 165	100	0
16	177	11	— 154	46	8
17	41	— 125	— 279	0	10
18	78	— 88	— 367	45	7
19	209	44	— 323	100	1
20	193	28	— 295	55	7
Decade departure			— 195		
21	206	41	— 254	100	0
22	173	8	— 246	60	3
23	154	— 10	— 256	60	5
24	187	23	— 233	71	4
25	127	— 37	— 270	30	9
26	256	92	— 178	100	1
27	189	25	— 153	83	6
28	61	— 102	— 255	0	9
29	39	— 124	— 379	2	9
30	193	30	— 349	76	3
31	112	— 52	— 401	4	10
Decade departure			— 106		
Total excess or deficiency since first of year			— 1882		

SOLAR RADIATION INTENSITIES AT SANTA FE, N. MEX., DURING SEPTEMBER, NOVEMBER, AND DECEMBER, 1915.

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The measurements summarized in Table 1 are in continuation of those published in the REVIEW for September, 1915, 43: 439-443, except that on November 1, 1915, Mr. Lee R. Grabill, jr., was detailed as an additional assistant at Santa Fe, and since that date has made all the pyrliometric readings.

It will be noted that in all three months the readings average higher than the means for the corresponding months published in the September REVIEW above referred to. Also, those for September 27, with the sun at zenith distance 48.3° or more, those for November 12, with the sun at zenith distance 60° or more, and all those for December 24, are higher than any previous corresponding readings at Santa Fe in a month with the same name.